

IT3200C/E



Overview

Low cost SMD TCXO using analogue IC for compensation, with voltage control option. Frequencies ranging from 10MHz to 40MHz.

Description

The I(V)T3200 C/E series employs analogue IC technology for the oscillator and temperature compensation. 3.2mm x 2.5mm in size, the RSX-8 crystal is surface mounted on top of the ceramic IC carrier. The segregation of the crystal from the oscillator further improves the reliability of the product.

Recommended Applications

Handset, GPS, PDA, PCMCIA CDPD cards, Automotive, Consumer Products, WiFi, WiMAX/WLAN, Communications, Other.

Features

Excellent phase noise performance

Standard temperature stability choices are $\pm 0.5\text{ppm}$, $\pm 1\text{ppm}$, $\pm 1.5\text{ppm}$ and $\pm 2.5\text{ppm}$ over wide temperature ranges

IT3200C/E Specifications

1.0 Specification References

1.1	Model Description	I(V)T3200 C/E Series
1.2	RoHS Compliant	Yes

2.0 Frequency Characteristics

Parameter	Test Condition	Value	Units
2.1	Frequency range	Frequency range available	10 to 40 MHz
2.2	Frequency calibration	Offset from nominal frequency measured at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$	1 max $\pm\text{ppm}$
2.3	Reflow shift	Two consecutive reflows as per attached profile after 1 hour recovery	1 max $\pm\text{ppm}$
2.4	Frequency stability over temperature	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range. Control voltage is set to midpoint of control voltage (Note 1, 2)	0.5 to 5 $\pm\text{ppm}$
2.5	Temperature range	The operating temperature range over which the frequency stability is measured for C series. (Note 3 & 10)	-40 to 85 $^{\circ}\text{C}$
2.6	Frequency slope	Minimum of 1 frequency reading every 2°C over the operating temperature range (Note 2, 4)	0.05 to 1 $\text{ppm}/^{\circ}\text{C}$
2.7	Static temperature hysteresis	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C	0.6 max ppm
2.8	Supply voltage stability	Supply voltage varied $\pm 5\%$ at 25°C (Note 4)	0.2 max $\pm\text{ppm}$
2.9	Load sensitivity	$\pm 10\%$ load change	0.2 max $\pm\text{ppm}$
2.10	Long term stability	Frequency drift over 1 year (Note 4)	2 max $\pm\text{ppm}$

3.0 Power Supply

Parameter	Test Condition	Value	Units
3.1	Supply voltage	Nominal supply voltage range (Note 5 & 10)	2.3 to 3.7 V
3.2	Current	At maximum supply voltage (Note 6)	2 max mA

4.0 Control Voltage (VCO) - Optional

Parameter	Test Condition	Value	Units
4.1	Control voltage range	The nominal control voltage value is midway between the minimum and	0.5 to 2.8 V
4.2	Frequency tuning	Frequency shift from minimum to maximum control voltages (Note 8 & 10)	6 to 50 ppm
4.3	Port input impedance	Measured between control voltage and GND pin	500 kOhm
4.4	Linearity	Deviation from the straight line curve fit	20 max %

5.0 Oscillator Output

	Parameter	Test Condition	Value	Units
5.1	Output waveform	DC coupled clipped sine wave (Note 9)		
5.2	Output voltage level	At minimum supply voltage (Note 6)	0.8	V
5.3	Output load resistance	Refer to test circuit	9 to 11	kOhm
5.4	Output load capacitance	Refer to test circuit	9 to 11	pF

6.0 SSB Phase Noise

	Parameter	Test Condition	Value	Units
6.1	SSB phase noise power density at 1Hz offset	Typical values for a 16.369MHz oscillator at 25°C	-60 max	dBc/Hz
6.2	SSB phase noise power density at 10Hz offset	Typical values for a 16.369MHz oscillator at 25°C	-89 max	dBc/Hz
6.3	SSB phase noise power density at 100Hz offset	Typical values for a 16.369MHz oscillator at 25°C	-113 max	dBc/Hz
6.4	SSB phase noise power density at 1kHz offset	Typical values for a 16.369MHz oscillator at 25°C	-132 max	dBc/Hz
6.5	SSB phase noise power density at 10kHz offset	Typical values for a 16.369MHz oscillator at 25°C	-145 max	dBc/Hz

7.0 Environmental

	Parameter	Test Condition
7.1	Shock	Half sine wave acceleration of 100G peak amplitude for 6mS duration, 3 cycles each plain
7.2	Humidity	After 48 hours at 85°C±2°C 85% relative humidity non-condensing
7.3	Thermal shock test	Exposed at -40°C for 30 minutes then to 85°C for 30 minutes repeatedly for 120 hours
7.4	Vibration	10G RMS from 30Hz to 1500Hz random in each of the 3 axis for 4 hours; total 12 hours
7.5	Storage temperature	-40 to 85°C

8.0 Marking

	Parameter	Test Condition
8.1	Type	Engraved
8.2	Line 1	Rakon Logo and the last four characters of the Internal Part Number
8.3	Line 2	Pin 1 mark and date code

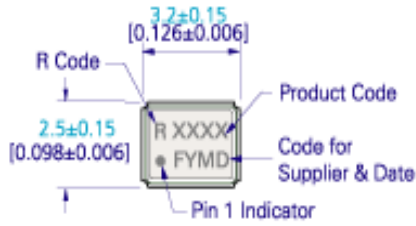
9.0 Manufacturing Information

	Parameter	Test Condition
9.1	Reflow	Solder reflow processes
9.2	Packaging description	Tape and reel

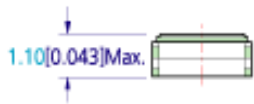
10.0 Specification Notes

	Parameter	Test Condition
10.1	1	A maximum frequency stability over the temperature is required to be specified. Standard options are ±0.5ppm, ±1ppm, ±2ppm
10.2	2	Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift
10.3	3	The operating temperature range needs to be specified. The extremes for these models are -40°C and 85°C
10.4	4	The maximum value is the specification. A minimum value, if present indicates the best specification available
10.5	5	The unit will operate on any voltage between minimum and maximum values
10.6	6	Specified for the load stated in Oscillator Output section
10.7	7	Voltage control cannot exceed Vcc -0.2V or below GDN +0.2V
10.8	8	The maximum frequency tuning range depends on the design frequency and the trimming sensitivity of the crystal. Linearity performance degrades if maximum frequency tuning setting is selected
10.9	9	External AC-Coupling capacitor required. 1nF or greater recommended
10.10	10	Not all variables are available on all models. Please consult Rakon Sales for further information

MODEL DRAWING



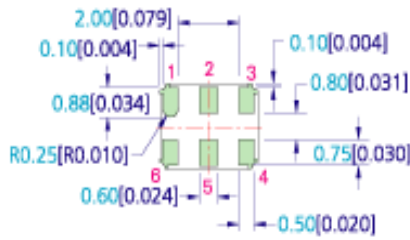
TOP VIEW



SIDE VIEW



END VIEW

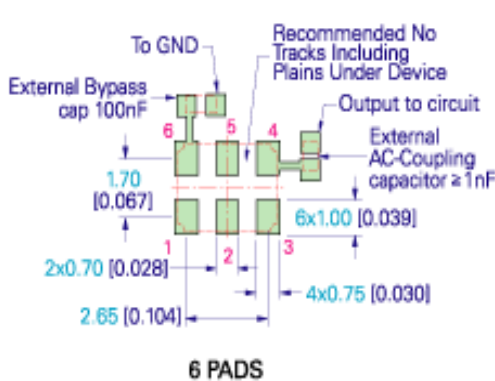


BOTTOM VIEW

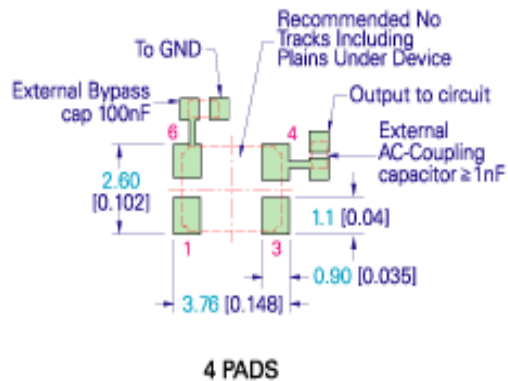
PIN CONNECTIONS

Pin	IT	IVT
1	GND RECOMMENDED	VCO
2	NC	NC
3	GND	GND
4	OUTPUT	OUTPUT
5	NC	NC
6	VCC	VCC

RECOMMENDED PAD LAYOUT - TOP VIEW



6 PADS



4 PADS

TITLE: I(V)T3200C MODEL

FILENAME: CAT434

REVISION: E

Tolerances:

RELATED DRAWING:

DATE: 17-Feb-09

XX ±0.5

X.X ±0.2

X.XX ±0.10

X.XXX ±0.05

X' ±1.0"

Millimetres [inch]

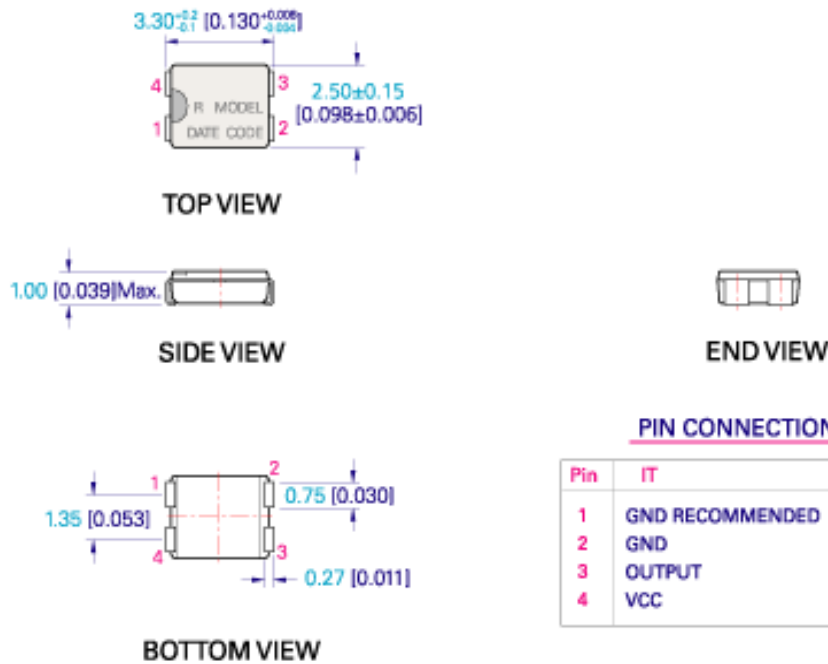
Hole ±0.10



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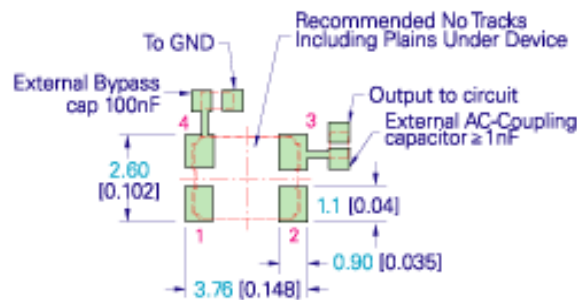
MODEL DRAWING



PIN CONNECTIONS

Pin	IT	IVT
1	GND RECOMMENDED	VC
2	GND	GND
3	OUTPUT	OUTPUT
4	VCC	VCC

RECOMMENDED PAD LAYOUT - TOP VIEW - FOR IVT3200 C & E PACKAGES



TITLE: I(V)T3200E MODEL

FILENAME: CAT389

REVISION: E

Tolerances:

RELATED DRAWINGS:

DATE: 18-Feb-09

XX ± 0.5

X.X ± 0.2

X.XX ± 0.10

X.XXX ± 0.06

X° $\pm 1.0^\circ$

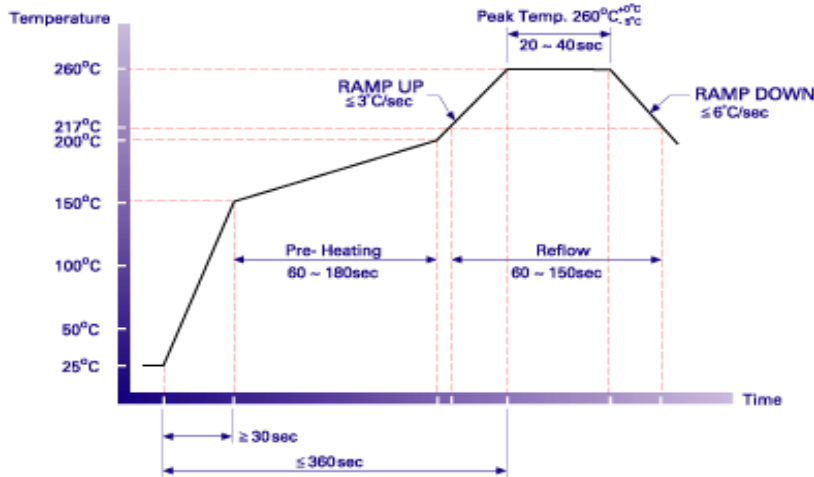
Hole ± 0.10

SCALE: 5 : 1

Millimetres [Inch]

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NOTE:
 The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon TCXO is determined by the solder paste manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

TITLE: 3200 SERIES Pb-FREE REFLOW

FILENAME: CAT324

REVISION: B

RELATED DRAWINGS:

DATE: 14-Mar-08

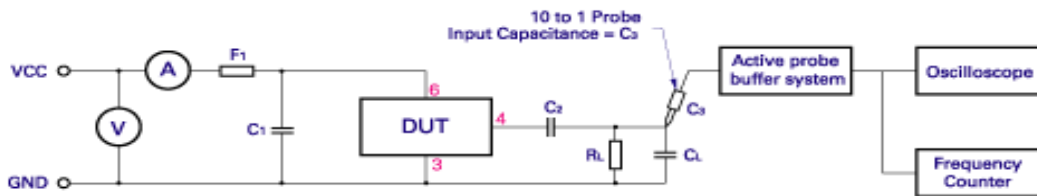
SCALE: NTS

Millimetres (inch)

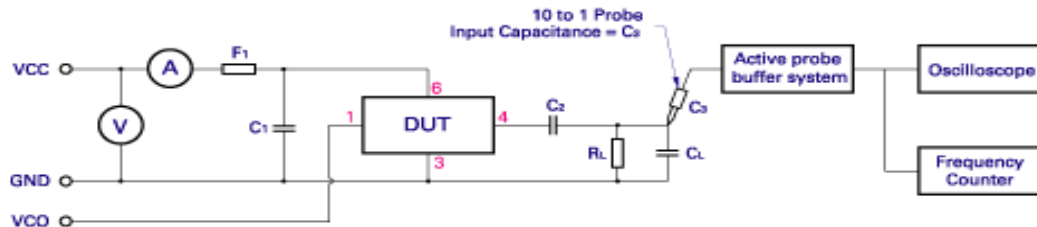


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IT TEST CIRCUIT :



IVT TEST CIRCUIT :



- C₁: 100nF
- C₂: ≥ 1nF
- R_L: 10K
- C_T = C_L + C_s (C_s - Oscilloscope probe capacitance)
- C_T as stated in OSCILLATOR OUTPUT section
- F₁: A ferrite bead or a resistor between 22Ω - 47Ω recommended.

TITLE: I(V)3200 SERIES TEST CIRCUIT

FILENAME: CAT286

REVISION: F

RELATED DRAWINGS:

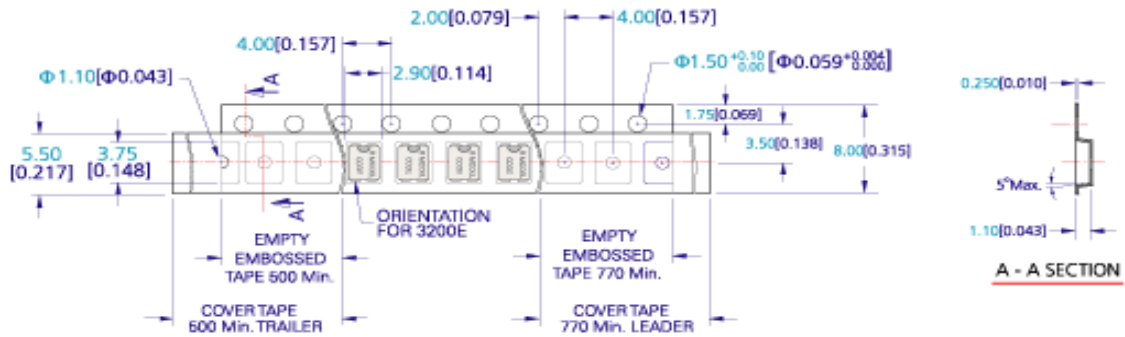
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SCALE: NTS

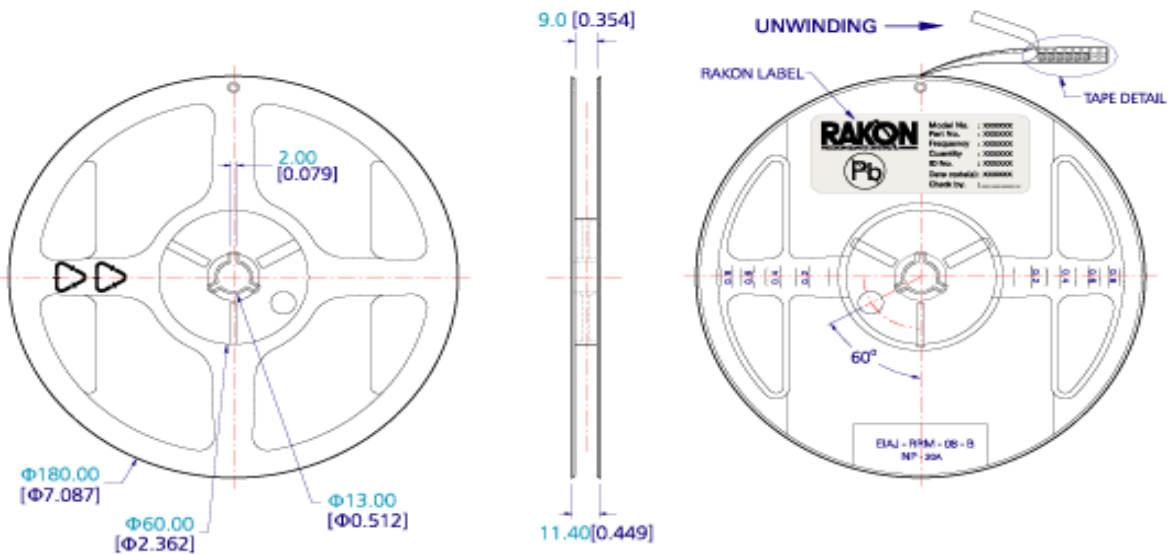
Millimetres (inch)



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TAPE DETAIL SCALE 2 : 1



REEL DETAIL SCALE 1 : 2.5

NOTE:
1. Φ180mm REEL'S STANDARD PACKING QUANTITY IS 2000 OSCILLATORS PER REEL.

TITLE: 3200E SERIES TAPE & Φ180 REEL

FILENAME: CAT395

REVISION: C

Tolerances:

RELATED DRAWINGS:

DATE: 26-Jul-07

XX ±0.5

SCALE: See Above

X.X ±0.2

Millimetres [inch]

X.XXX ±0.10

X.XXX ±0.05

X° ±1.0°

Hole ±0.10



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